morrison

DINOSAURS!

•DISCOVER THE GIANTS OF THE PREHISTORIC WORLD•

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DINOSAURS!

DISCOVER THE GIANTS OF THE PREHISTORIC WORLD

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DROMICEIOMIMUS

Speedy *Dromiceiomimus* looked like the large, flightless bird, the emu. But it had no wings or feathers.

Dromiceiomimus was as long as an average-sized car. Although it weighed about the same as a giant panda, *Dromiceiomimus* was able to outrun larger and heavier predators, such as *Albertosaurus*, quite easily.

ENORMOUS EYES

Like its relative *Struthiomimus*, *Dromiceiomimus* had large eyes for the size of its head. Its keen eyesight kept the nippy dinosaur safe from harm. It could spot an enemy approaching from a distance and make a swift escape. Its sharp eyes were also helpful for tracking down and pouncing on small, fast-moving mammals and insects.

SNATCH AND GRAB

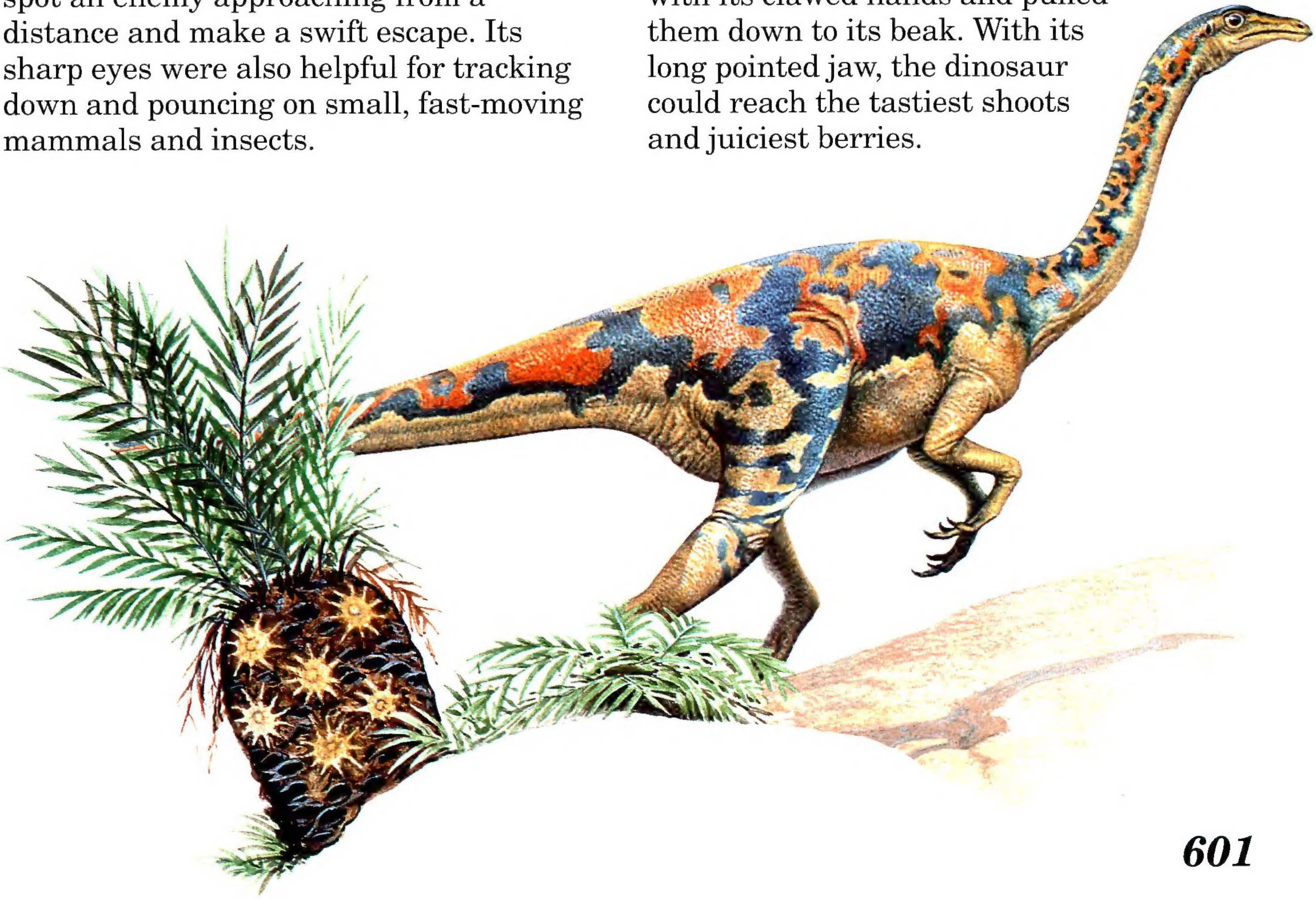
Dromiceiomimus had a long, toothless beak. It snapped up flying insects as they flew through the air, and scooped up small ground creatures as they scuttled for safety through the undergrowth.

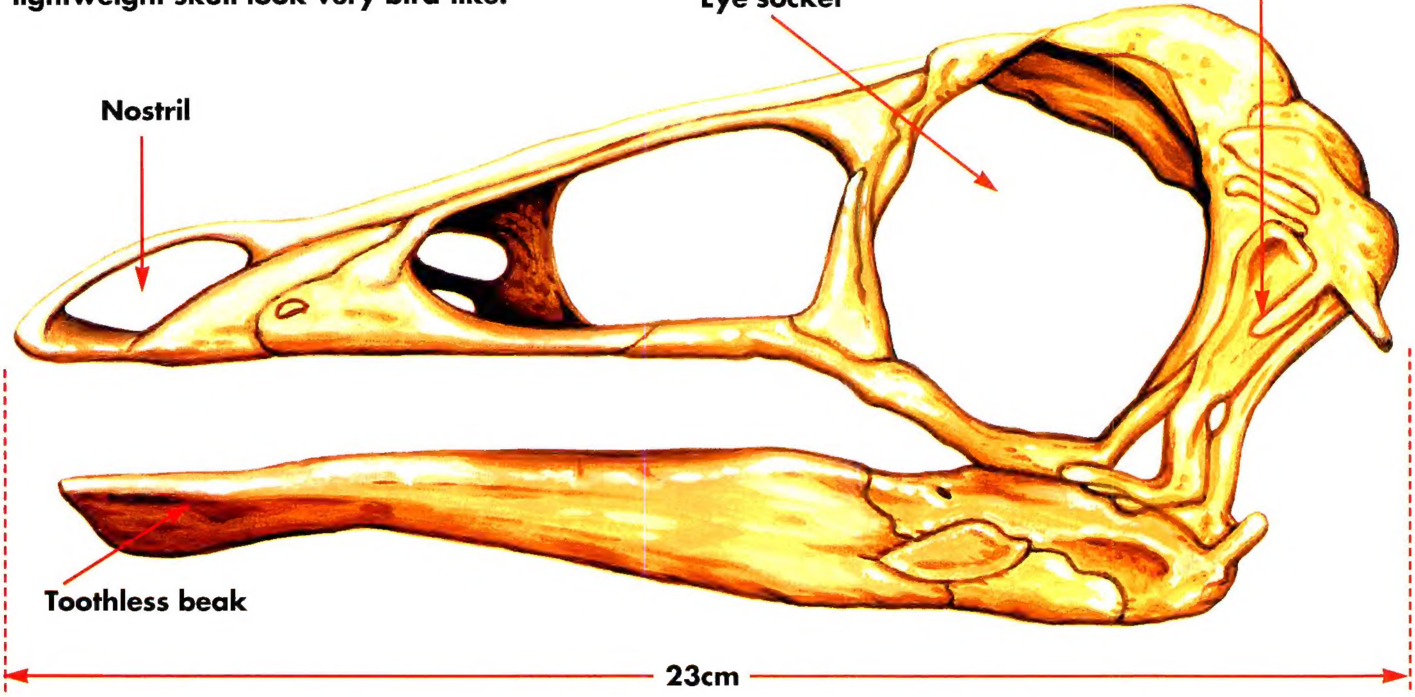
VARIED DIET

Dromiceiomimus enjoyed eating a variety of different things. When tackling plants, it used the horny edges of its beak to bite into berries, seeds and nuts.

SLIM ARMS

Dromiceiomimus had short, slender arms with long, three-fingered hands. It probably grasped overhanging branches with its clawed hands and pulled them down to its beak. With its long pointed jaw, the dinosaur could reach the tastiest shoots and juiciest berries.




The large eye sockets and toothless beak make *Dromiceiomimus'* lightweight skull look very bird-like.

WELL-BALANCED

In spite of its thin legs, *Dromiceiomimus* could run very fast. Experts who have studied its footprints believe it sometimes reached speeds of 72 km/h, making it one of the fastest of all the dinosaurs.

GOOD GRIP

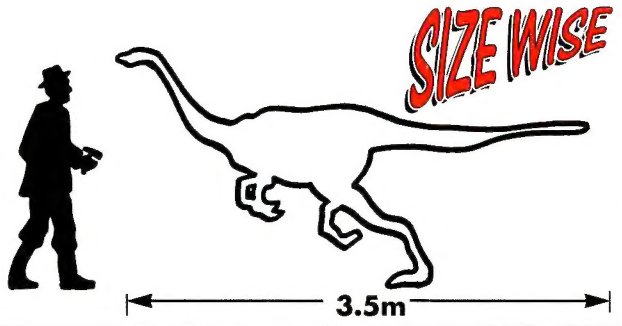
The long claws on *Dromiceiomimus'* feet gripped the ground like the spikes on a running shoe. As it ran, its tail stood out stiffly to balance its short body.

MOBILE NECK

Dromiceiomimus had a long, flexible neck to support its small head. Its skull was light so it could turn its head quickly. This gave it a good view of what was going on around it. *Dromiceiomimus* could also move its head up and down easily.
It could stretch up high to keep a sharp look out, or snap up prey at ground level.

MONSTER FACTS

- **NAME:** *Dromiceiomimus* (drome-i-see-oh-mime-us) means 'emu mimic' because it looked like an emu of today
- **SIZE:** up to 3.5m long
- **FOOD:** small mammals, lizards, flying insects and, perhaps, fruit and berries
- **LIVED:** about 80 – 60 million years ago in the Late Cretaceous Period in Alberta, Canada



Is it true that dinosaurs used camouflage as a way of protecting themselves?

Yes, the colour and pattern of many animals' skin helps them to blend in with their surroundings. Arctic hares are white against snow, and zebras' stripes confuse predators. Camouflage can also help fierce animals, such as tigers, to hide from their prey. It is possible that defenceless dinosaurs like *Dromiceiomimus* had some sort of camouflage which helped them to survive.

An emu cannot fly, but it can run very fast (above). Like *Dromiceiomimus,* it dashes through the undergrowth on long slender legs to escape the threat of danger.

BIG BRAIN

Dromiceiomimus had an unusually large brain for a dinosaur, which meant that its reactions were very fast. This made the dinosaur a formidable hunter. It combined the advantages of sharp eyesight, fast legs and grasping hands to catch its prey in one deadly movement.

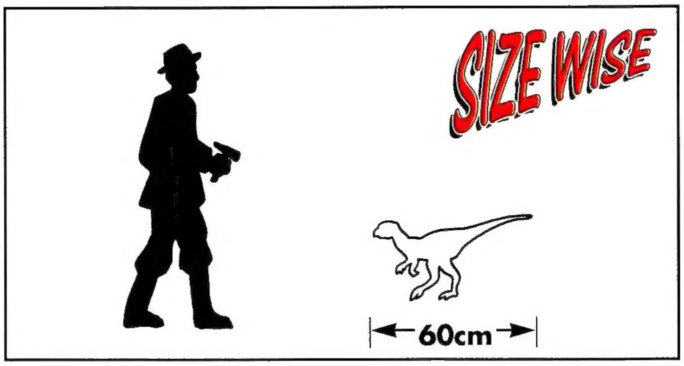
LEAELLYNASAURA

Leaellynasaura, an Australian dinosaur, was named after a little girl.

Palaeontologists Thomas and Patricia Rich discovered a new hypsilophodontid dinosaur at Dinosaur Cove in south-eastern Australia, in 1987. They decided to name it after their 11-year-old daughter, Leaellyn.

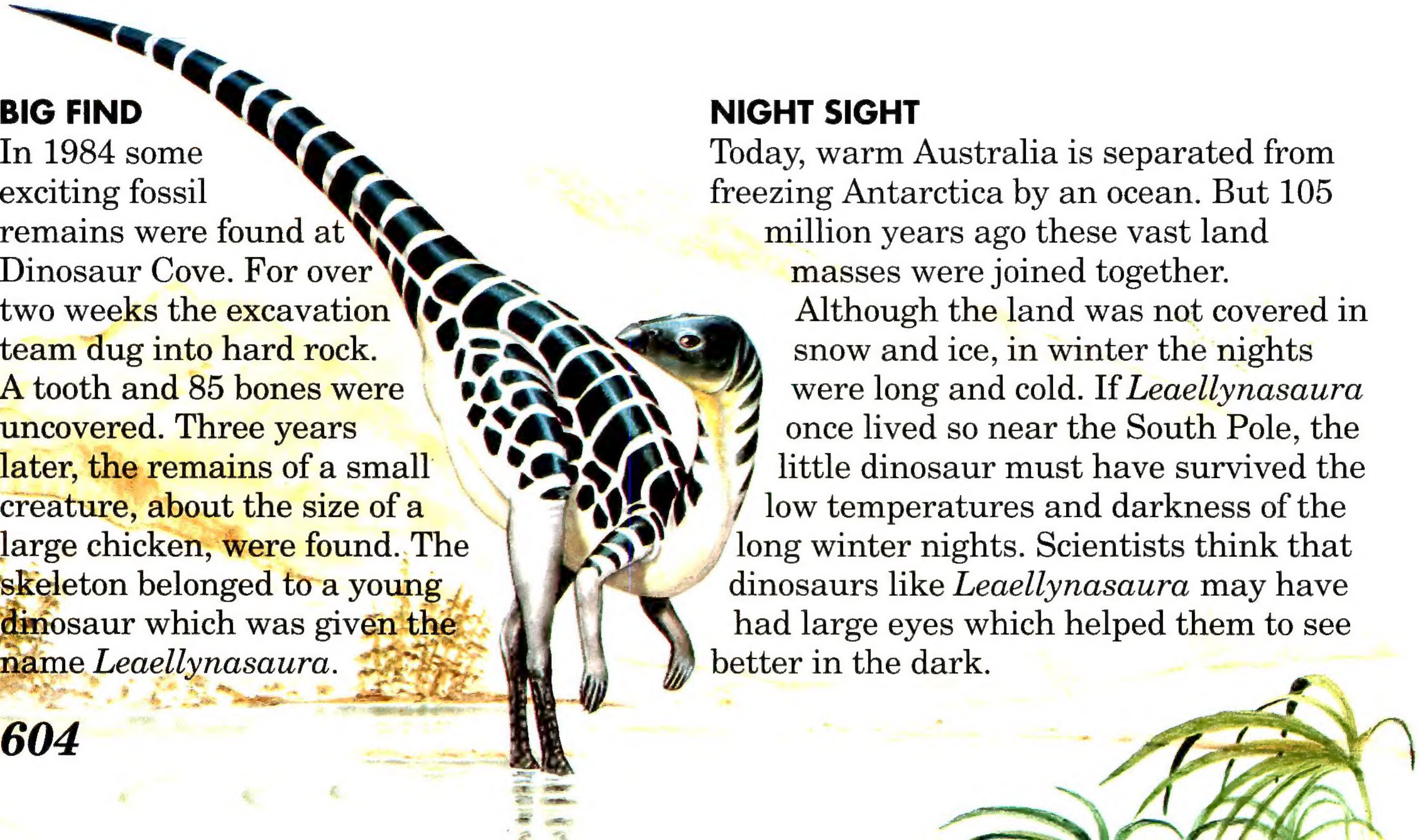
SMALL AND FAST

Leaellynasaura was a small dinosaur, only about 60cm long. It was a member of the family of dinosaurs nicknamed 'dinosaur gazelles'. Hypsilophodontids moved swiftly on two long legs. *Leaellynasaura* probably used its speed to escape large meat-eating dinosaurs, similar to fierce *Allosaurus,* that lived in Australia.



MONSTER FACTS

- **NAME:** *Leaellynasaura* (lee-ellen-a-saw-ra) means 'Leaellyn's dinosaur'
- **SIZE:** about 60cm long
- **FOOD:** plants
- **LIVED:** about 105 million years ago in the Early Cretaceous Period in Victoria, south-eastern Australia



BIG FIND

In 1984 some exciting fossil remains were found at Dinosaur Cove. For over two weeks the excavation team dug into hard rock. A tooth and 85 bones were uncovered. Three years later, the remains of a small creature, about the size of a large chicken, were found. The skeleton belonged to a young dinosaur which was given the name *Leaellynasaura*.

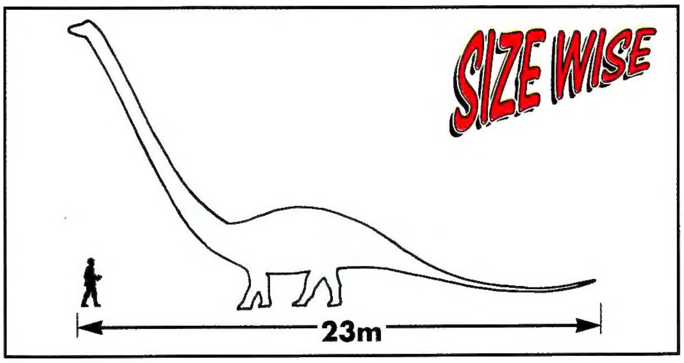
NIGHT SIGHT

Today, warm Australia is separated from freezing Antarctica by an ocean. But 105 million years ago these vast land masses were joined together. Although the land was not covered in snow and ice, in winter the nights were long and cold. If *Leaellynasaura* once lived so near the South Pole, the little dinosaur must have survived the low temperatures and darkness of the long winter nights. Scientists think that dinosaurs like *Leaellynasaura* may have had large eyes which helped them to see better in the dark.

QUAESITOSAURUS

Massive *Quaesitosaurus* was a rare plant-eating dinosaur with a very long neck and tail.

So far, only the skull of *Quaesitosaurus* has been found. But experts think it was similar to *Diplodocus,* even though it lived about 70 million years later.



MONSTER FACTS

- **NAME:** *Quaesitosaurus* (key-sit-oh-saw-rus) means 'unusual reptile'
- **SIZE:** possibly up to 23m
- **FOOD:** plants
- **LIVED:** 80 – 60 million years ago in the Late Cretaceous Period in Mongolia

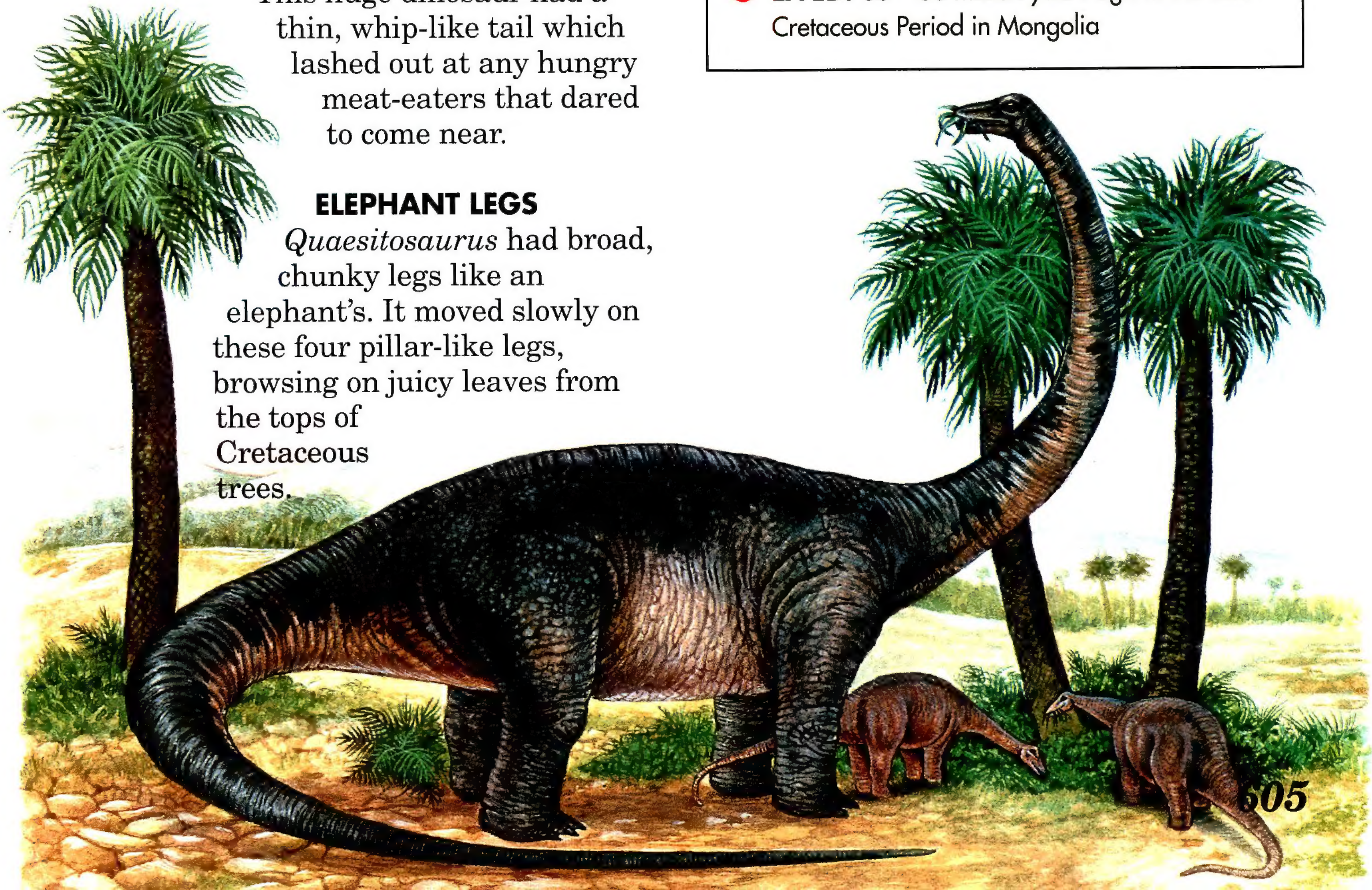
HEAD TO TAIL

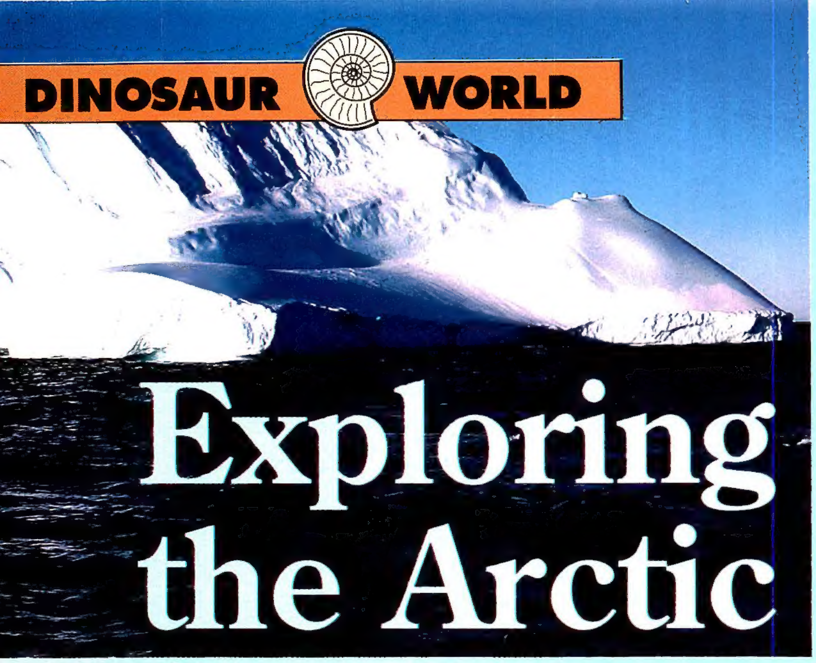
Quaesitosaurus was as long as a railway carriage. Most of its great length was made up of its neck and tail. These were held up by strong muscles and bony rods to stop them flopping to the ground.

This huge dinosaur had a thin, whip-like tail which lashed out at any hungry meat-eaters that dared to come near.

ELEPHANT LEGS

Quaesitosaurus had broad, chunky legs like an elephant's. It moved slowly on these four pillar-like legs, browsing on juicy leaves from the tops of Cretaceous trees.





Exploring the Arctic

Today, the Arctic is the frozen roof of the world. How could dinosaurs ever have lived there?

On a map or a globe the Arctic is shown as a white area, with the North Pole in the middle. But it is not land. It is huge rafts of ice, 5 – 10m thick, floating on the Arctic Ocean. There is no land at the North Pole, as there is at the South Pole.

CHILLED TO THE BONE

When the Earth goes round the Sun it is tilted. This means that the Arctic faces away from the Sun in winter and has little daylight for many weeks. At this time the Arctic is a place of intense cold, bone-chilling winds and endless night. Icebergs and pack-ice float on the almost-frozen ocean. How could dinosaurs, or anything else, live there?

ARCTIC DINOSAURS

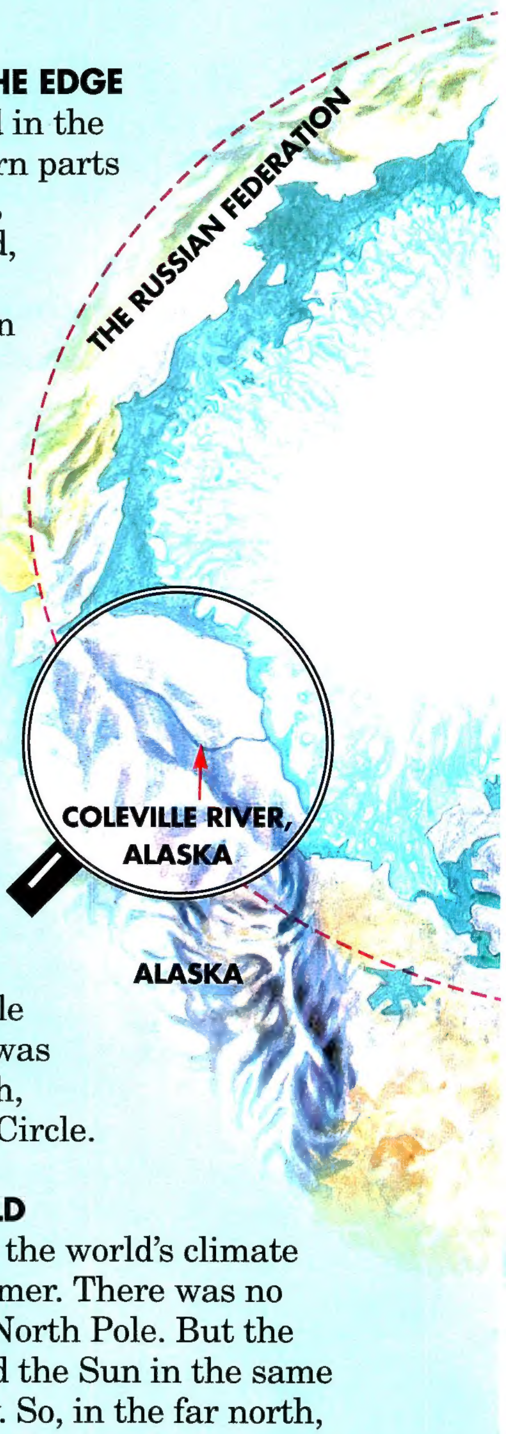
Dinosaurs did live in the lands around the Arctic. They included duckbilled plant-eaters like *Parasaurolophus*, meat-eaters resembling *Tyrannosaurus* and *Troödon*, and many other animals and plants. There are several reasons why dinosaurs could live in the Arctic, 70 million years ago.

LAND AROUND THE EDGE

There is some land in the Arctic. The northern parts of Alaska, Canada, Greenland, Iceland, Europe and the Russian Federation all poke into the Arctic Circle.

WANDERING CONTINENTS

During the Age of the Dinosaurs, these lands were not where they are today. Over millions of years they have moved around the globe. When the first dinosaurs appeared, the whole of North America was much further south, outside the Arctic Circle.



A WARMER WORLD

In dinosaur times, the world's climate was generally warmer. There was no endless ice at the North Pole. But the Earth went around the Sun in the same way as it does now. So, in the far north, there were weeks of winter darkness, when the weather was probably near freezing.

HOW FAR NORTH?

Scientists have found rich collections of dinosaur fossils in central North America. But they did not know how far north the dinosaur remains would go. Dinosaurs would have had difficulty coping with the low temperatures, and the long weeks of darkness, when no plants could grow.

The northern parts of several countries extend into the Arctic Circle, surrounding the raft of ice around the North Pole.

Bill Clemens (left), was the first scientist to find the fossils of Arctic dinosaurs. Here he carefully uncovers some of the limb bones of an *Edmontosaurus* skeleton at Coleville River in Alaska.

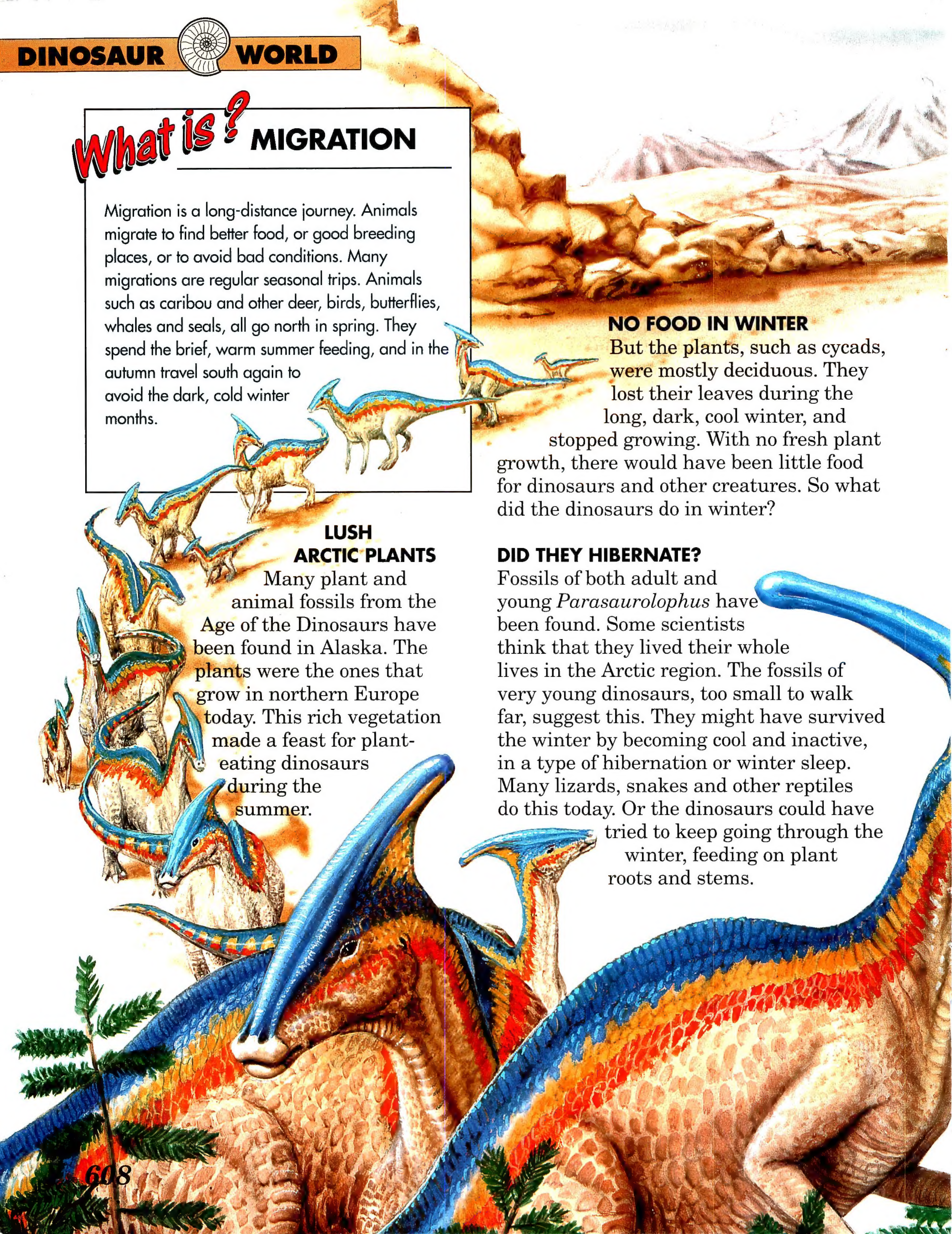
ALASKAN PLANT-EATERS

In 1985 Bill Clemens and his team from the University of California were on an expedition to Alaska. They dug for fossils on the North Slope, near the Coleville River. They struck lucky, and found dinosaur remains! They were from the duckbilled hadrosaurs *Parasaurolophus* and *Edmontosaurus*, embedded in rocks from the Late Cretaceous Period.

AND MEAT-EATERS TOO!

Bill Clemens' expedition also found the fossil teeth of meat-eating dinosaurs, which looked like *Tyrannosaurus* and *Troödon*. At last, the Arctic dinosaurs had been discovered. But the finds posed more questions. Could the dinosaurs live there all the time? Or did they migrate to and fro each year, as many animals do nowadays?

Arctic animals today are well protected against the intense cold of winters near the North Pole. The polar bear's thick coat (far left) is both warm and waterproof. The fur of both the Arctic hare (left) and Arctic fox (right) changes from brown in summer to white in winter, making it hard for predators to spot them in the snow.



What is? MIGRATION

Migration is a long-distance journey. Animals migrate to find better food, or good breeding places, or to avoid bad conditions. Many migrations are regular seasonal trips. Animals such as caribou and other deer, birds, butterflies, whales and seals, all go north in spring. They spend the brief, warm summer feeding, and in the autumn travel south again to avoid the dark, cold winter months.

LUSH ARCTIC PLANTS

Many plant and animal fossils from the Age of the Dinosaurs have been found in Alaska. The plants were the ones that grow in northern Europe today. This rich vegetation made a feast for plant-eating dinosaurs during the summer.

NO FOOD IN WINTER

But the plants, such as cycads, were mostly deciduous. They lost their leaves during the long, dark, cool winter, and stopped growing. With no fresh plant growth, there would have been little food for dinosaurs and other creatures. So what did the dinosaurs do in winter?

DID THEY HIBERNATE?

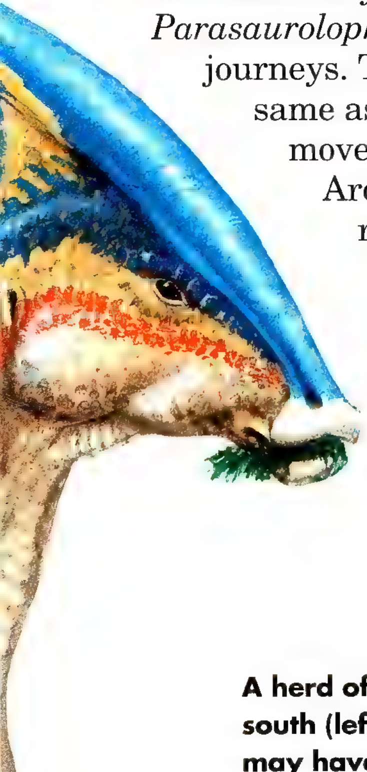
Fossils of both adult and young *Parasaurolophus* have been found. Some scientists think that they lived their whole lives in the Arctic region. The fossils of very young dinosaurs, too small to walk far, suggest this. They might have survived the winter by becoming cool and inactive, in a type of hibernation or winter sleep. Many lizards, snakes and other reptiles do this today. Or the dinosaurs could have tried to keep going through the winter, feeding on plant roots and stems.

OR MIGRATE?

Other scientists believe that dinosaurs could not have survived a long, cold winter. They must have migrated, on long journeys each year. Migrants that do this today include reindeer and caribou on land, whales in the sea, and geese in the air.

TRAVELLING HERDS

Fossil bones and footprints from other places show that hadrosaurs such as *Parasaurolophus* or *Edmontosaurus* probably lived in herds. There would have been safety in numbers for *Parasaurolophus* on long-distance journeys. They may have done the same as caribou do nowadays – moved north in spring, fed on Arctic summer plants, and retreated south in the autumn. The tyrannosaur dinosaurs would have followed them, as wolves follow caribou, picking off the stragglers, the sick, the young and old.



A herd of *Parasaurolophus* migrates south (left). The dinosaurs' tall crests may have been coloured so that they could see each other clearly. A predator shadows them. A herd of migrating reindeer today (bottom right).

Modern Canada geese (above) migrate north. Today, only tough plants like the bearberry (below) can survive in the Arctic.

KEEPING IN TOUCH

The migrating animals would have had a better chance of survival if they had kept in touch with each other. *Parasaurolophus* used their hollow crests to call to each other.

LOOKING FOR ANSWERS

How do we explain fossils of both young and adult dinosaurs? The young may have hatched in the north, fed on summer food, and grown big enough to migrate south. Or they may have hatched in the south, where the climate was warm. No dinosaur nests have been found in Alaska. More discoveries may solve the mysteries of Arctic dinosaurs – or they may pose yet more questions!

GIANTS OF THE PAST

Splash! A pack of *Dromiceiomimus* charges into a swampy pool in pursuit of a snack. Their long, thin beaks are just the right shape for catching flying insects and crunching them into small pieces. With their flexible necks at full stretch, the dinosaurs greedily snap up the slowest of the whirring, fleeing dragonflies.

DROMICEIOMIMUS

3-D Gallery

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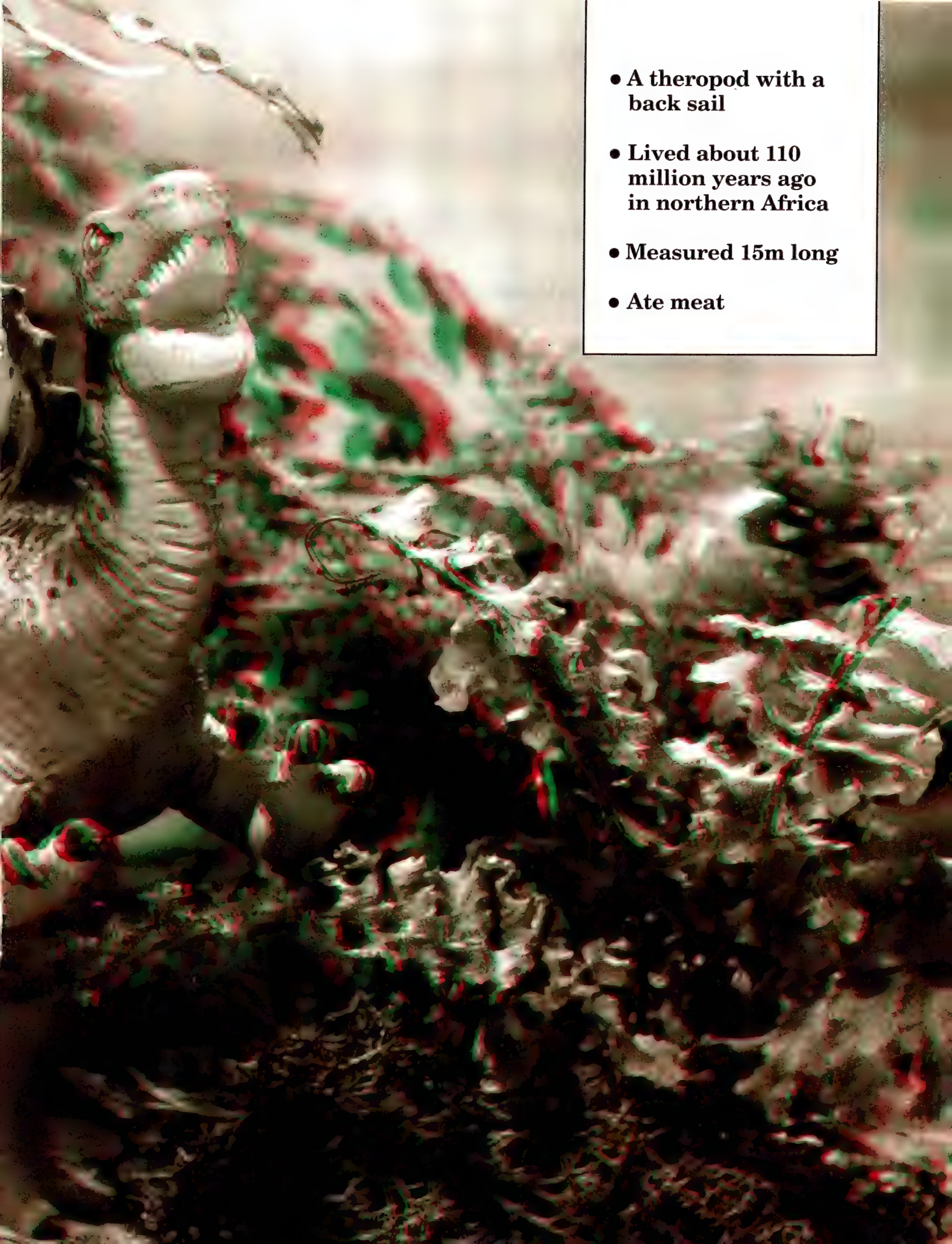
SPINOSAURUS

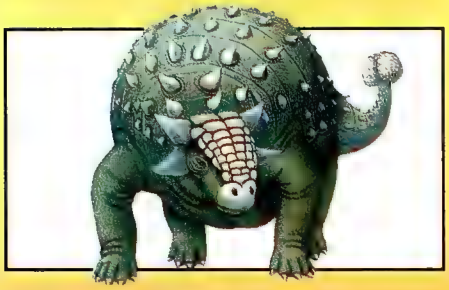


- A theropod with a back sail
- Lived about 110 million years ago in northern Africa
- Measured 15m long
- Ate meat

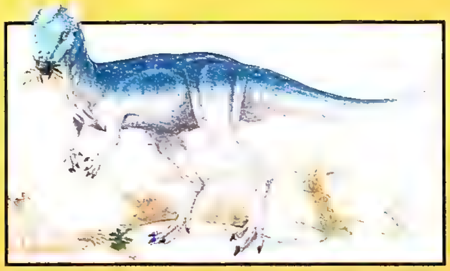
Plant-eaters on parade

The dinosaurs on this page lived millions of years apart. They were all different sizes and came from various families. But they all had one thing in common – they ate plants.

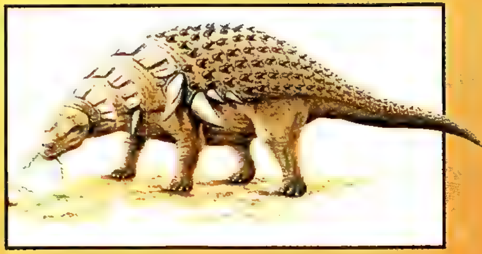
Every day a vegetarian dinosaur munched its way through huge amounts of tough food. Instead of knives and forks, the herbivores were armed with rows of teeth for stripping, grinding or munching.



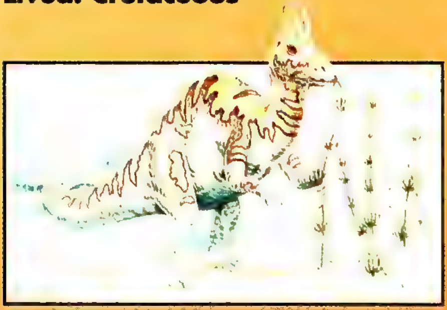
Name: ***Saichania***
Family: Ankylosaurid
Size: 7m long
Lived: Cretaceous



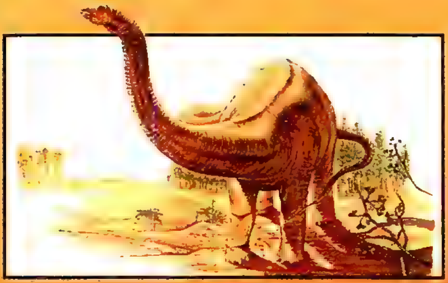
Name: ***Stygimoloch***
Family: Pachycephalosaurid
Size: 3m long
Lived: Cretaceous



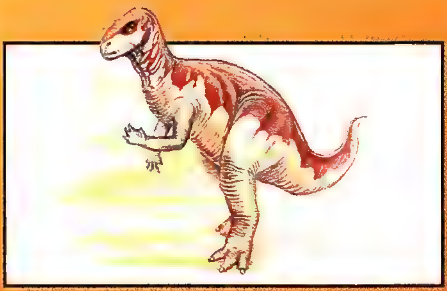
Name: ***Edmontonia***
Family: Nodosaurid
Size: 7m long
Lived: Late Cretaceous



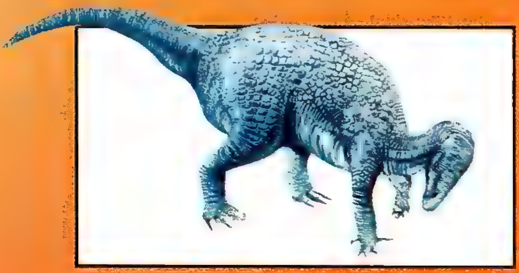
Name: ***Corythosaurus***
Family: Hadrosaurid
Size: 10m long
Lived: Mid – Late Cretaceous



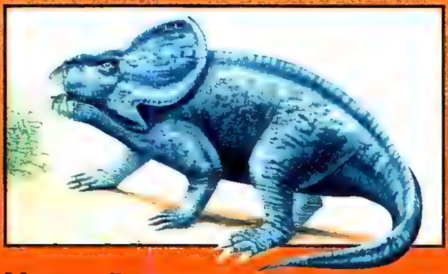
Name: ***Dicraeosaurus***
Family: Diplodocid
Size: 13 – 20m long
Lived: Late Jurassic



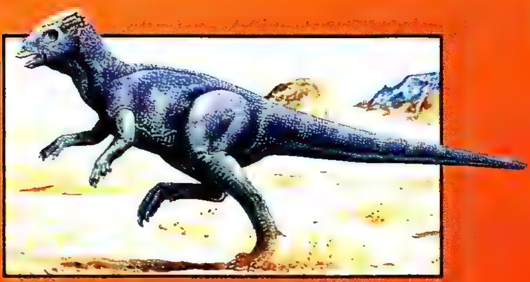
Name: ***Camptosaurus***
Family: Iguanodontid
Size: 7m long
Lived: Jurassic – Cretaceous



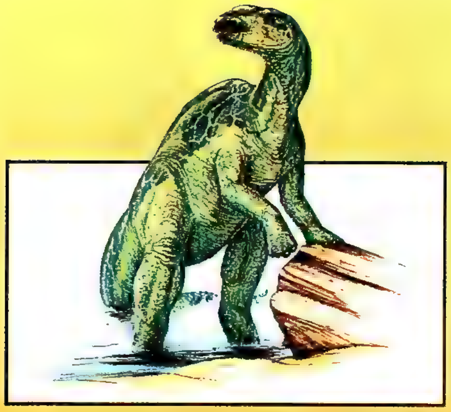
Name: ***Iguanodon***
Family: Iguanodontid
Size: 10m long
Lived: Early – Mid Cretaceous



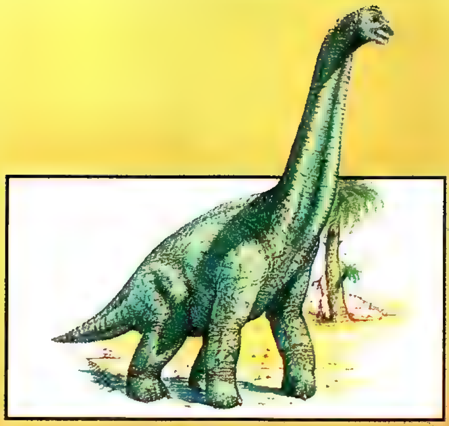
Name: ***Protoceratops***
Family: Protoceratopid
Size: 1.8m long
Lived: Late Cretaceous



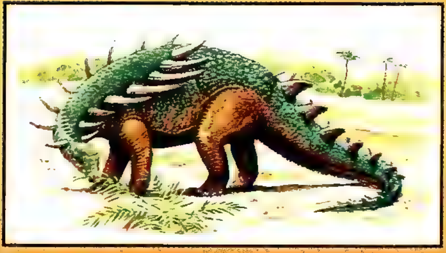
Name: ***Homalocephale***
Family: Homalocephalid
Size: 3m long
Lived: Late Cretaceous



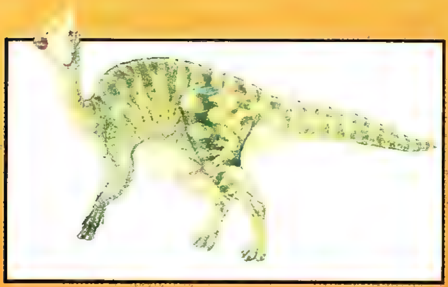
Name: *Anatotitan*
Family: Hadrosaurid
Size: 12.2m long
Lived: Cretaceous



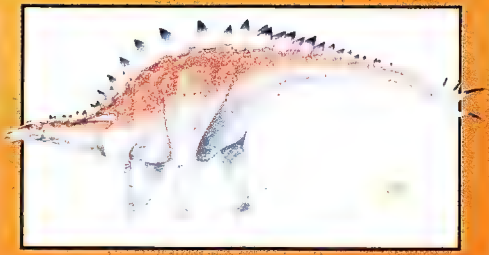
Name: *Brachiosaurus*
Family: Brachiosaurid
Size: 23m long
Lived: Late Jurassic – Cretaceous



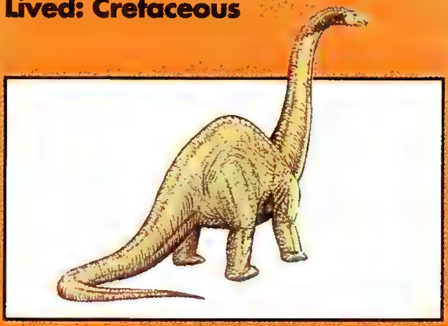
Name: *Polacanthus*
Family: Nodosaurid
Size: 4m long
Lived: Cretaceous



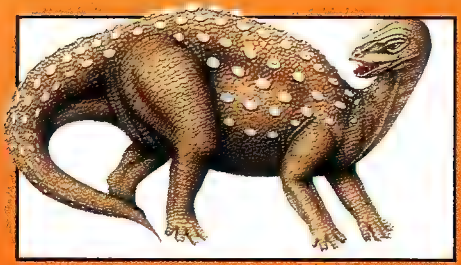
Name: *Saurolophus*
Family: Hadrosaurid
Size: 9 – 12m long
Lived: Late Cretaceous



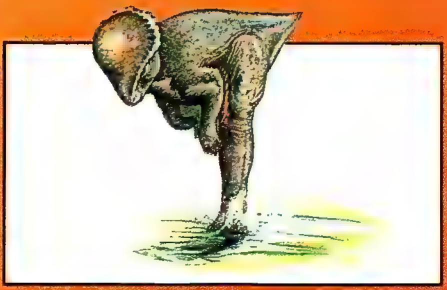
Name: *Huayangosaurus*
Family: Stegosaurid
Size: 4m long
Lived: Mid – Late Jurassic



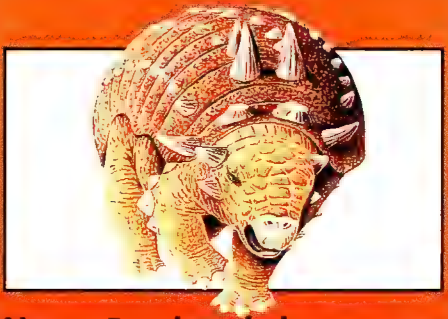
Name: *Cetiosaurus*
Family: Cetiosaurid
Size: 18m long
Lived: Late Jurassic



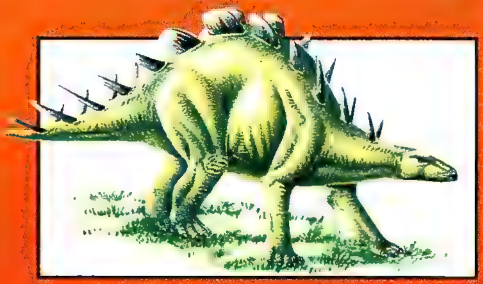
Name: *Minmi*
Family: Nodosaurid
Size: 2m long
Lived: Early Cretaceous



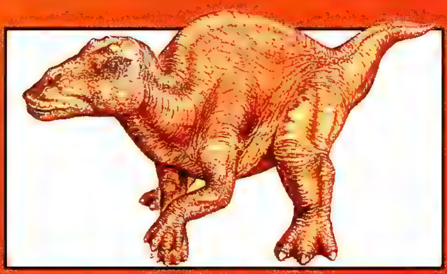
Name: *Stegoceras*
Family: Pachycephalosaurid
Size: 2.5m long
Lived: Late Cretaceous



Name: *Euoplocephalus*
Family: Ankylosaurid
Size: 7m long
Lived: Late Cretaceous



Name: *Dacentrurus*
Family: Stegosaurid
Size: 4.5m long
Lived: Mid – Late Jurassic



Name: *Maiasaura*
Family: Hadrosaurid
Size: 9m long
Lived: Late Cretaceous

KEY

TRIASSIC:
245 – 204 million years ago

JURASSIC:
204 – 140 million years ago

CRETACEOUS:
140 – 66 million years ago

Giant jigsaw

How do scientists reconstruct the skeleton of a dinosaur? Why do they do it? What do they learn?

Piecing together the skeleton of a creature that died millions of years ago is difficult detective work. When it is a completely new kind of dinosaur it is even harder. To help them, scientists need to know how the skeletons of living animals are constructed and how they function. Detailed studies of today's animals give palaeontologists important clues as to how a dinosaur's body worked.

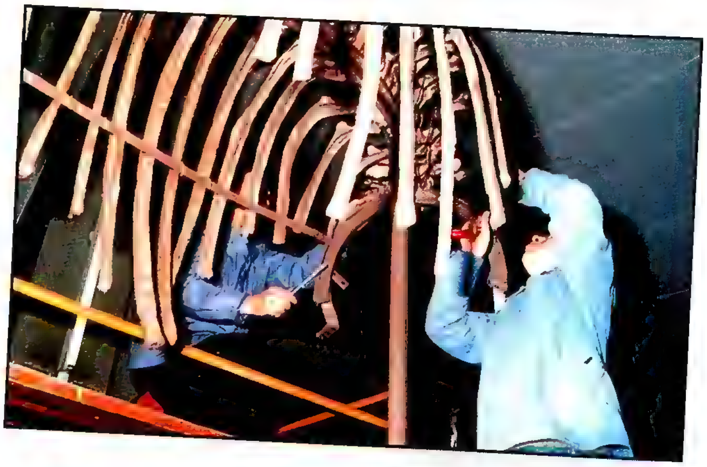
SKELETON SENSATION

Rebuilding a dinosaur helps experts to understand what the animal was really like. When it is complete, the reconstruction will also help experts to understand how other dinosaurs might have looked and moved. Experts from around the world will flock to see an unusual dinosaur when it is first put on display in a museum.

CHINESE PUZZLE

In 1951, a Chinese professor discovered the almost complete skeleton of a duckbilled dinosaur that was new to science. He called it *Tsintaosaurus* ('reptile from Tsintao'). Years of study went into its reconstruction, but finally it went on show. However, reconstructions are so difficult that it is possible to make mistakes.

1 ***Tsintaosaurus* was tall. The experts who rebuilt it had to stand on scaffolding to reach its back. Here two backbones are handed up to be fitted on to the skeleton.**



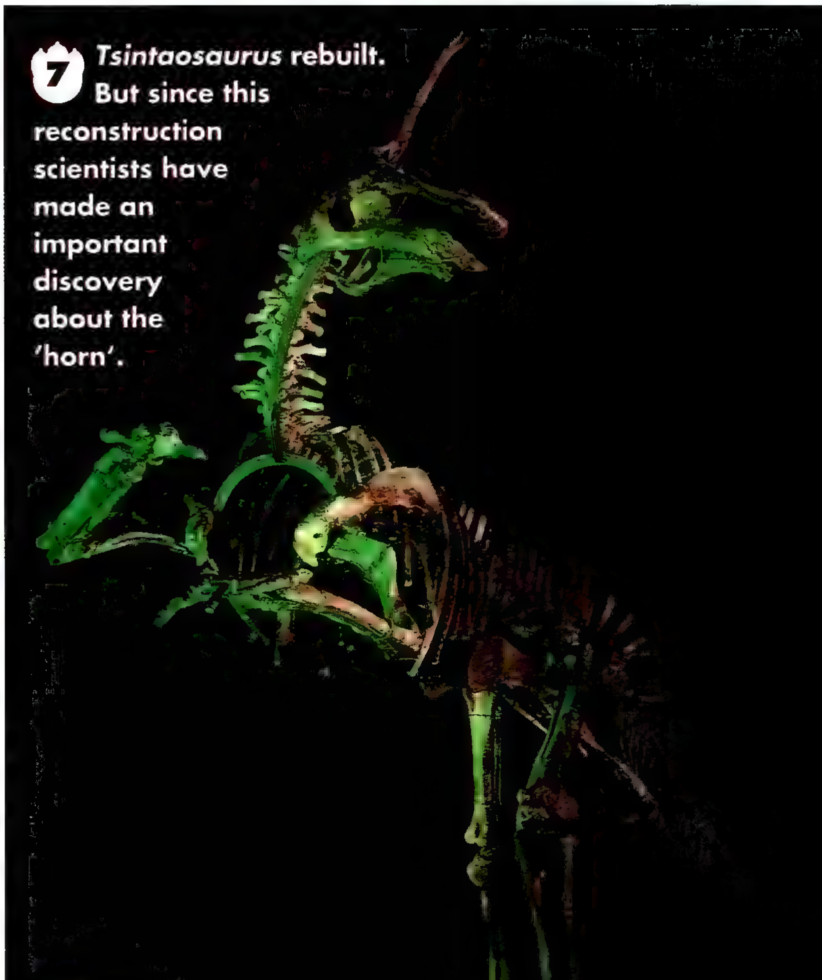
2 An expert assembles part of the huge rib cage. A steel framework was built to support the heavy bones.

3 A bristling fence of bony prongs ran from the top of the spine to the tip of the tail. They helped to strengthen the back.

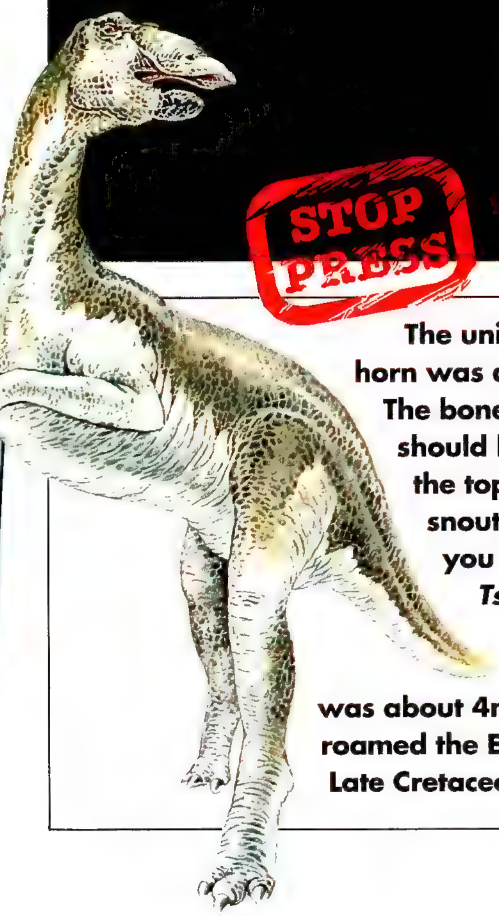
4 One mighty shoulder blade is lifted into place. *Tsintaosaurus* probably walked or waded on all fours on some occasions.

5 The view through the towering arch of the hind legs. The two sharp hip bones point backwards. That means *Tsintaosaurus* was a bird-hipped dinosaur.

6 Two experts slot the skull into position. The scientists have reconstructed it with a curious unicorn-like 'horn' of bone.



7 *Tsintaosaurus* rebuilt. But since this reconstruction scientists have made an important discovery about the 'horn'.



STOP PRESS

The unicorn-like horn was a mistake! The bone of the 'horn' should lie flat along the top of the snout. On the left you can see *Tsintaosaurus* as it really looked. It was about 4m long and roamed the Earth in the Late Cretaceous.

Behind the scenes

Months, or even years, of hard work go into preparing a dinosaur skeleton.

Big dinosaur museums have hundreds, or thousands, of fossil bones stored away. Only the best are put on show. Before a dinosaur skeleton can go on view, each bone has to be cleaned in the laboratory.

Most dinosaur bones arrive at the lab in protective plaster jackets. This *Edmontosaurus* fossil is still encased in the plaster that protected it on its long journey from the dig.

Cleaning fossils can be dangerous. This scientist wears a mask to protect him as he drills rock away from bones.

THE BIGGER THE BETTER

Dinosaur labs have to be large. They must house enormous bones. Some are rather like huge warehouses with rows of extra-strong shelves to hold the heavy fossils.

ROCK HARD

Lab scientists have to free the bones from the rock in which they were found. Luckily, unlike rock, dinosaur bones are usually smooth on the outside and dark brown in colour. So it is not too difficult to tell bone from rock. But rock can be very hard. It took thousands of hours to chip the ironstone away from a *Baryonyx* skeleton.

FINISHING TOUCH

Dinosaur bones need to be protected from damage. So a thin coating of diluted glue, or lacquer, is brushed over them. It makes them look dark and shiny.

A scientist (right) pushes a fibreglass tube into the hip of *Massospondylus* to hold it together.

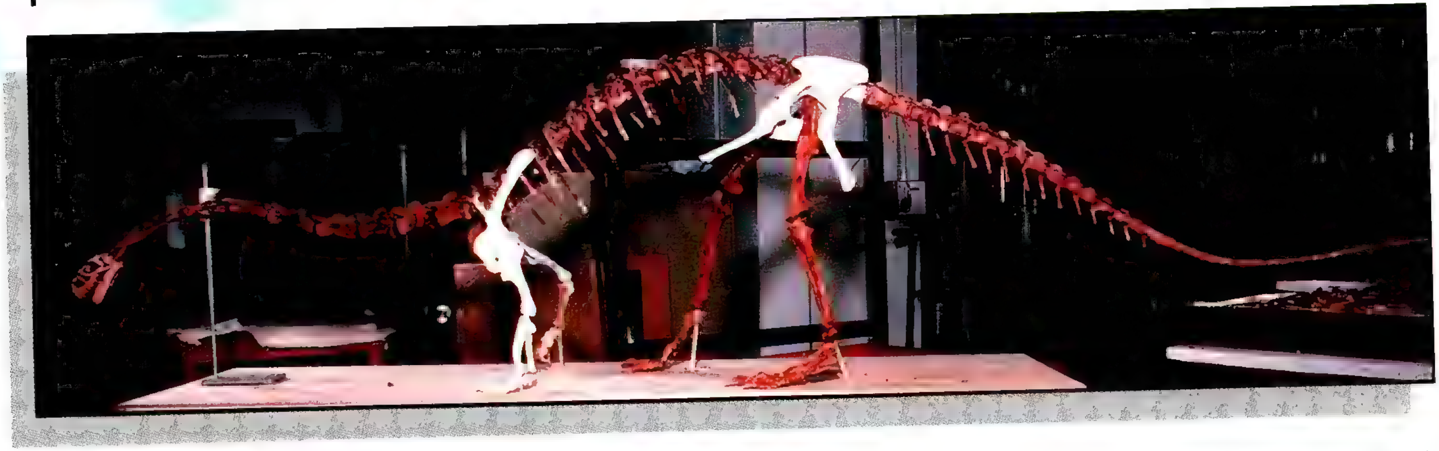
Cleaned fossils are coated with a special hardener made from resin. It strengthens and protects the delicate bones. Here (above) it is applied to the ankle and foot bones of *Edmontosaurus*.

IT'S A FACT

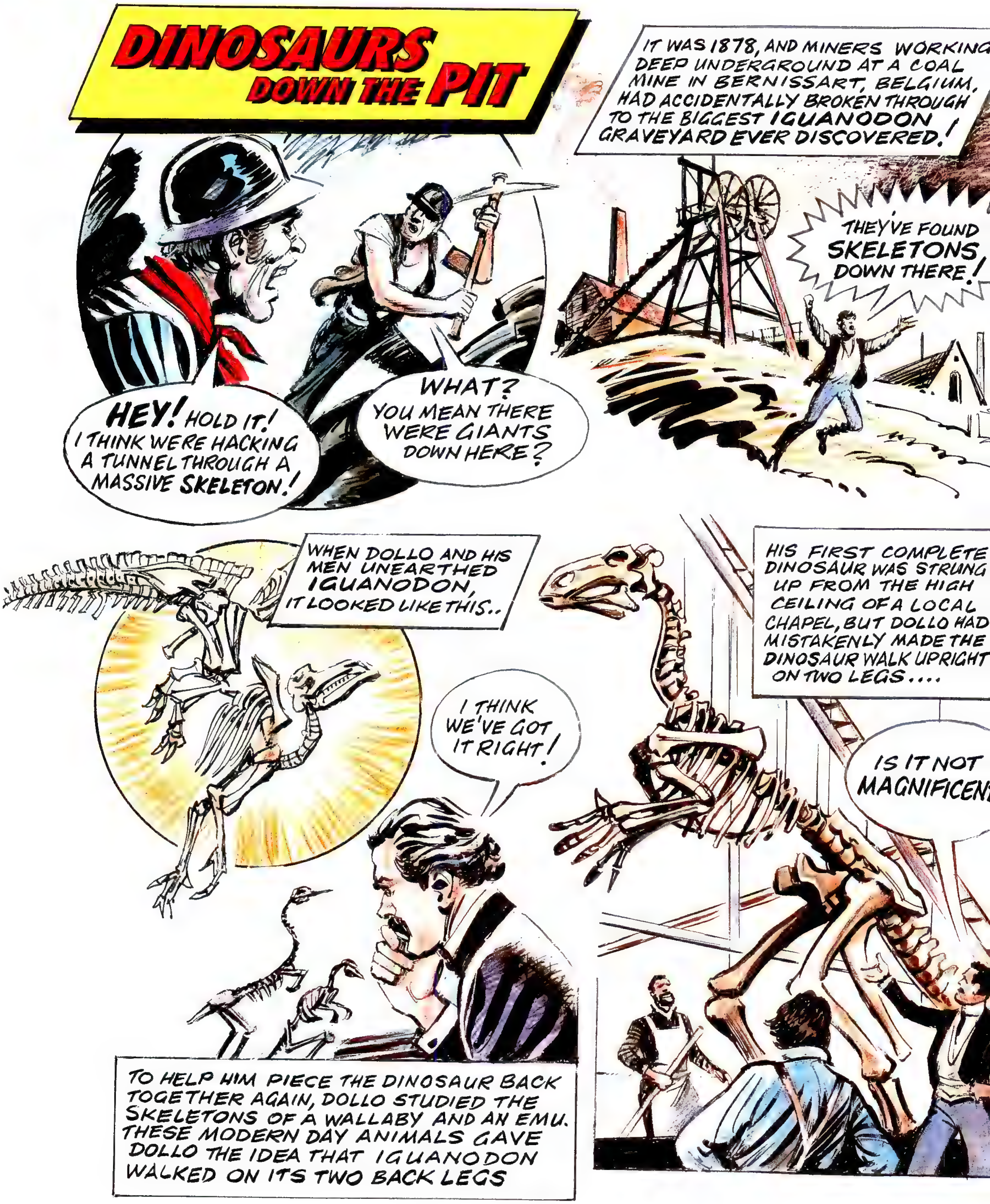
BONE MOULD

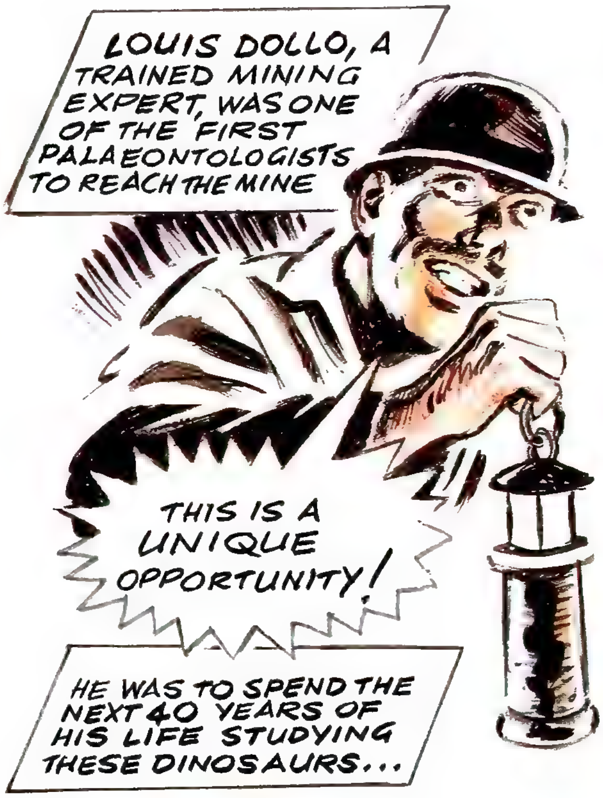
Fibreglass or plaster casts are often made of the most interesting dinosaur bones. Dozens of identical casts can be made from a mould of just one bone. Big dinosaur museums keep lots of casts of their best bones. They can use them to build skeletons in different positions.

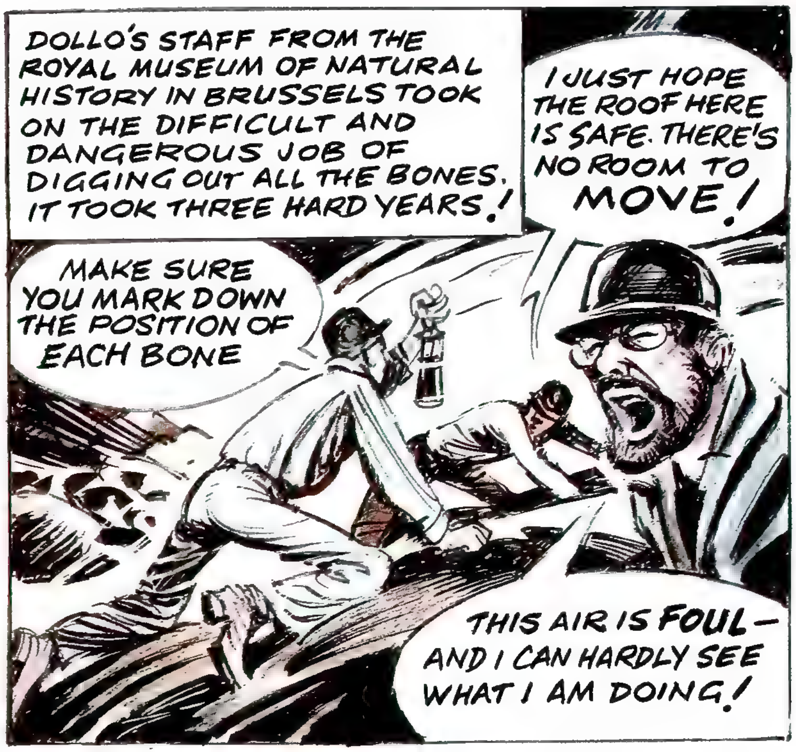
A complete *Massospondylus* skeleton (below). The white parts are plaster casts of missing bones which fill in the gaps. They will be painted to match the rest of the skeleton.

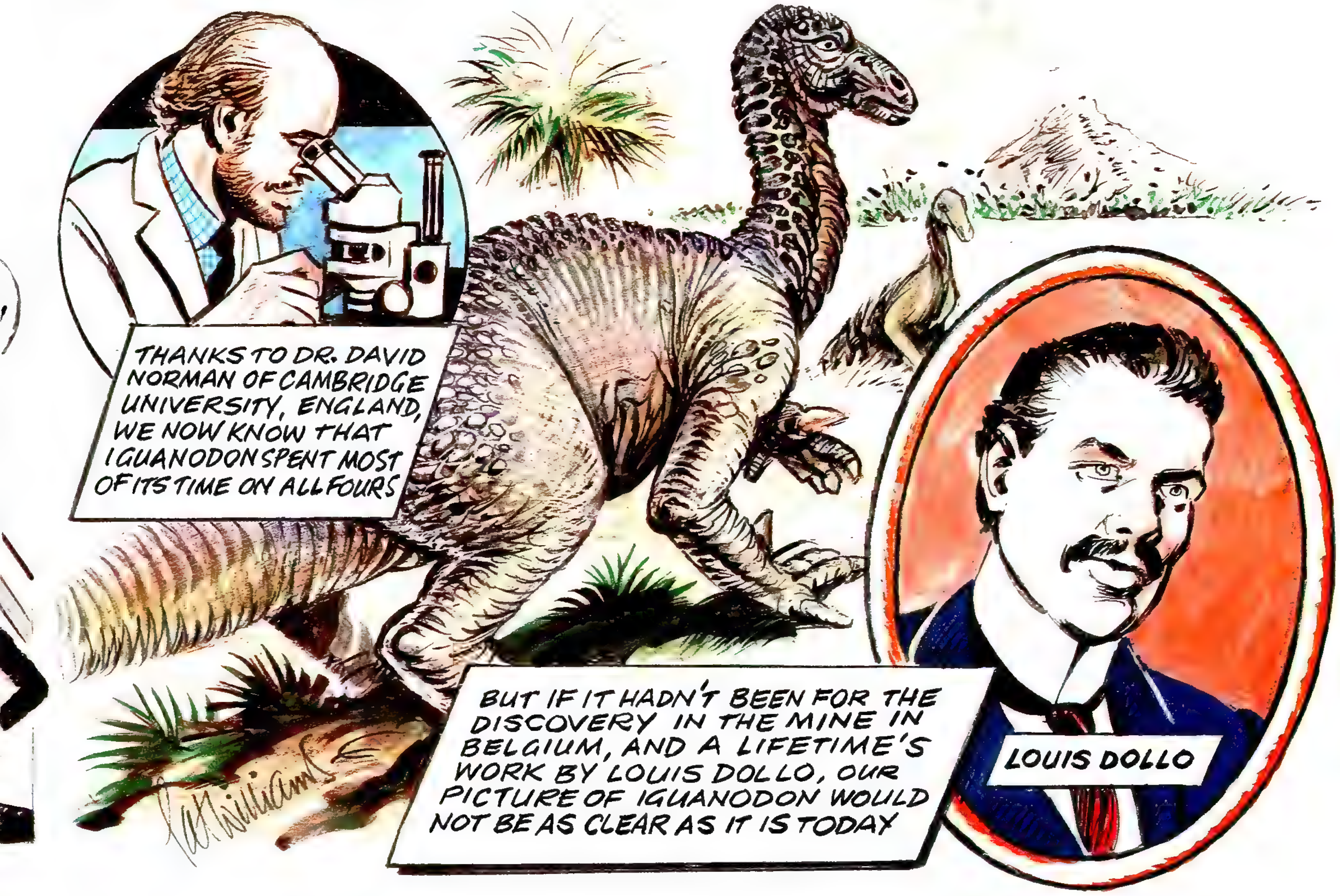


DINOSAURS DOWN THE PIT


IT WAS 1878, AND MINERS WORKING DEEP UNDERGROUND AT A COAL MINE IN BERNISSART, BELGIUM, HAD ACCIDENTALLY BROKEN THROUGH TO THE BIGGEST IGUANODON GRAVEYARD EVER DISCOVERED!
HEY! HOLD IT! I THINK WE'RE HACKING A TUNNEL THROUGH A MASSIVE SKELETON!
WHAT? YOU MEAN THERE WERE GIANTS DOWN HERE?
THEY'VE FOUND SKELETONS DOWN THERE!
WHEN DOLLO AND HIS MEN UNEARTHED IGUANODON, IT LOOKED LIKE THIS..
I THINK WE'VE GOT IT RIGHT!
TO HELP HIM PIECE THE DINOSAUR BACK TOGETHER AGAIN, DOLLO STUDIED THE SKELETONS OF A WALLABY AND AN EMU. THESE MODERN DAY ANIMALS GAVE DOLLO THE IDEA THAT IGUANODON WALKED ON ITS TWO BACK LEGS
HIS FIRST COMPLETE DINOSAUR WAS STRUNG UP FROM THE HIGH CEILING OF A LOCAL CHAPEL, BUT DOLLO HAD MISTAKENLY MADE THE DINOSAUR WALK UPRIGHT ON TWO LEGS....
IS IT NOT MAGNIFICEN


LOUIS DOLLO, A TRAINED MINING EXPERT, WAS ONE OF THE FIRST PALAEONTOLOGISTS TO REACH THE MINE
THIS IS A UNIQUE OPPORTUNITY!
HE WAS TO SPEND THE NEXT 40 YEARS OF HIS LIFE STUDYING THESE DINOSAURS...


DOLLO'S STAFF FROM THE ROYAL MUSEUM OF NATURAL HISTORY IN BRUSSELS TOOK ON THE DIFFICULT AND DANGEROUS JOB OF DIGGING OUT ALL THE BONES. IT TOOK THREE HARD YEARS!
I JUST HOPE THE ROOF HERE IS SAFE. THERE'S NO ROOM TO MOVE!
MAKE SURE YOU MARK DOWN THE POSITION OF EACH BONE
THIS AIR IS FOUL – AND I CAN HARDLY SEE WHAT I AM DOING!


THANKS TO DR. DAVID NORMAN OF CAMBRIDGE UNIVERSITY, ENGLAND, WE NOW KNOW THAT IGUANODON SPENT MOST OF ITS TIME ON ALL FOURS
BUT IF IT HADN'T BEEN FOR THE DISCOVERY IN THE MINE IN BELGIUM, AND A LIFETIME'S WORK BY LOUIS DOLLO, OUR PICTURE OF IGUANODON WOULD NOT BE AS CLEAR AS IT IS TODAY
LOUIS DOLLO

Improve and test your knowledge with...

DINO Fact File

Follow the footprints to complete the quiz and get to the bottom of the question!

1 *Dromiceiomimus* looked very much like:
a) a kangaroo
b) a platypus
c) an emu

2 How fast did *Dromiceiomimus* run?
a) 72 km/h
b) 9 km/h
c) 33 km/h

Rare bird

The bones of birds are very light and rarely last long enough to go through the slow process of becoming a fossil. That is why bird fossils dating back to the Age of the Dinosaurs are rare.

6 *Tsintaosaurus* did not have:
a) a horn on its head
b) bird-like hips
c) large hind legs

7 Where was a large graveyard of *Iguanodon* found?
a) in a volcanic crater
b) on a building site
c) down a coal mine

8 Dinosaurs may have migrated. What is migration?
a) a long distance journey
b) a headache
c) a feast

9 Scientists protect dinosaur bones by:
a) encasing them in bronze
b) wrapping them in plaster
c) brushing them with glue

Stuck in the mud

Scientists found the jumbled up remains of several dinosaur fossils preserved in a quarry. Standing like pillars amongst these bones were 12 large legs and feet, still intact. The bones probably belonged to huge plant-eating dinosaurs which had become hopelessly stuck in the soggy mud.

10 What did plant-eating dinosaurs use to cut through tough plants?
a) knives and forks
b) sharp fingernails
c) rows of teeth

Fine wings

A pterosaur's wingspan could be over 10m – as long as a large truck. Astonishingly, the bones of these vast wings were very thin tubes, rather like drinking straws.

3 ***Leaellynasaura*** **was named after:**

- **a) a place**
- **b) a little girl**
- **c) a pet cat**

4 ***Quaesitosaurus*** **was as long as:**

- **a) a car**
- **b) a caravan**
- **c) a railway carriage**

5 ***Lambeosaurus*** **was named after:**

- **a) a woolly lamb**
- **b) Lawrence Lambe**
- **c) a Lamborghini**

Experts outshone

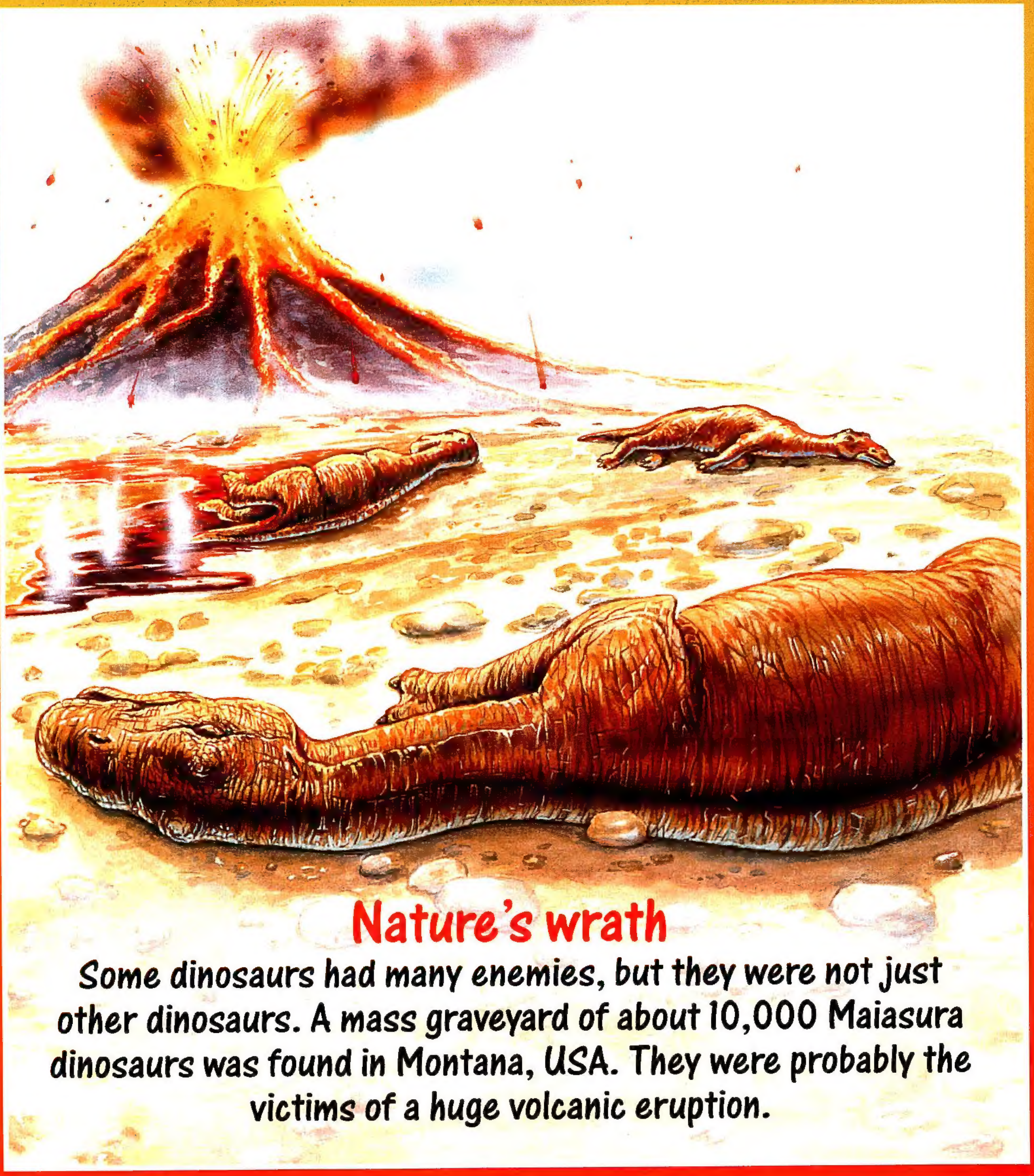
It is not always the experts who make dinosaur fossil discoveries. On an expedition to northern Arizona, the experts were outshone by a local Navajo Indian, who found the first remains of Dilophosaurus, a large meat-eating dinosaur about the length of a lorry.

The whole picture

To help piece together the lives of dinosaurs, scientists study not only dinosaur fossils, but also the fossil remains of plants, insects and other animals buried alongside the dinosaurs.

Mini mammals

Although the very first mammals appeared about 10 million years after the first dinosaurs, they were never any bigger than a large rat. It was not until dinosaurs disappeared that they became a dominant form of life on Earth.



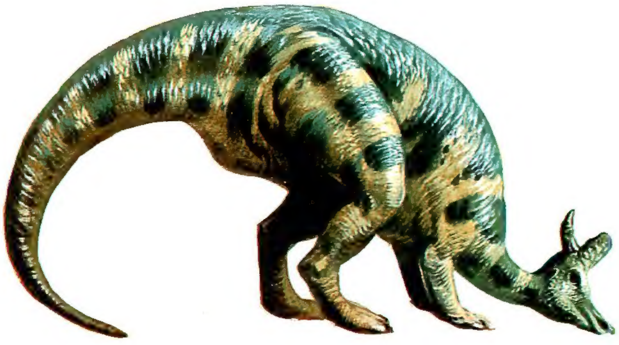
Nature's wrath

Some dinosaurs had many enemies, but they were not just other dinosaurs. A mass graveyard of about 10,000 Maiasura dinosaurs was found in Montana, USA. They were probably the victims of a huge volcanic eruption.

Answers to the questions on inside back cover

LAMBEOSAURUS 70 MYA

Lambeosaurus (lam-bee-oh-saw-rus) was named after a Canadian palaeontologist, Lawrence Lambe. It was as long as a lorry and had a strange head crest, shaped like a mitten with a long spike that pointed backwards. Scientists think that *Lambeosaurus* made loud noises through the hollow tubes in its crest to call to other dinosaurs. *Lambeosaurus* usually walked on four legs and fed on plants. It lived in the Late Cretaceous Period in Alberta, Canada, as well as USA and Mexico.

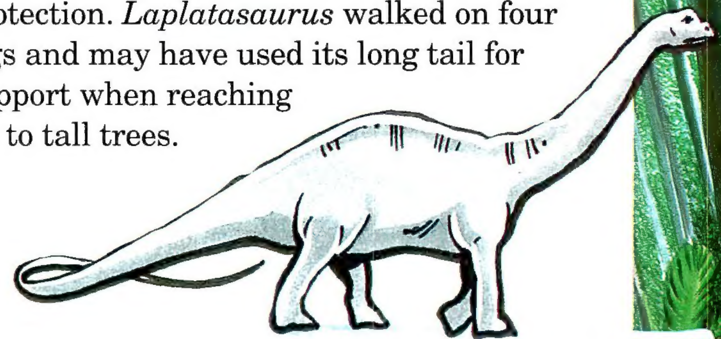


LANASAURUS 190 MYA

Lanasaurus (la-nah-saw-rus) was discovered in the Orange Free State in South Africa. All that remained of this small dinosaur was part of its jaw and some teeth. Like *Heterodontosaurus, Lanasaurus* probably had more than one sort of tooth. Chisel-like cheek teeth were used for chewing. Its long tusks were for defence and attracting mates. *Lanasaurus* was an agile dinosaur that could run fast on two legs. Its name means 'woolly reptile'. Some scientists think that it may be the same as *Lycorhinus*, as they were both found in the same region of South Africa.

LAPLATASAURUS 80 MYA

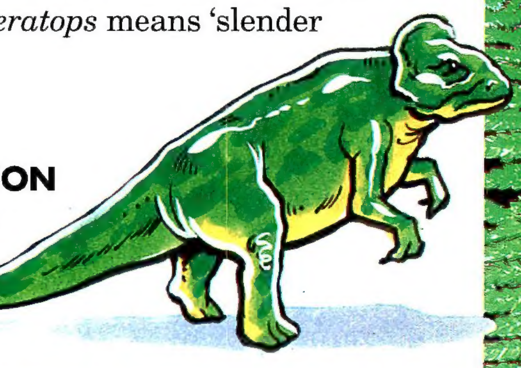
Long-necked *Laplatasaurus* (la-pla-ta-saw-rus) was a plant-eating dinosaur. It was named after La Plata, the part of Argentina where its remains were found. *Laplatasaurus* was as long as two double-decker buses standing bumper to bumper. Like its relative *Saltasaurus, Laplatasaurus* was an unusual sauropod. Both of these dinosaurs had bony armour-plating and bumps on their skin for protection. *Laplatasaurus* walked on four legs and may have used its long tail for support when reaching up to tall trees.



LEPTOCERATOPS 75 MYA

This small ceratopian lived in the Late Cretaceous Period in Canada and the USA. Sometimes it may have walked upright on its long hind legs, leaving its short arms and grasping hands free to gather plants. *Leptoceratops* (lep-toe-ser-a-tops) was as long as a sheep and weighed about 55kg. It had a sloping face and a small frill at the back of its skull. *Leptoceratops* means 'slender horned face'.

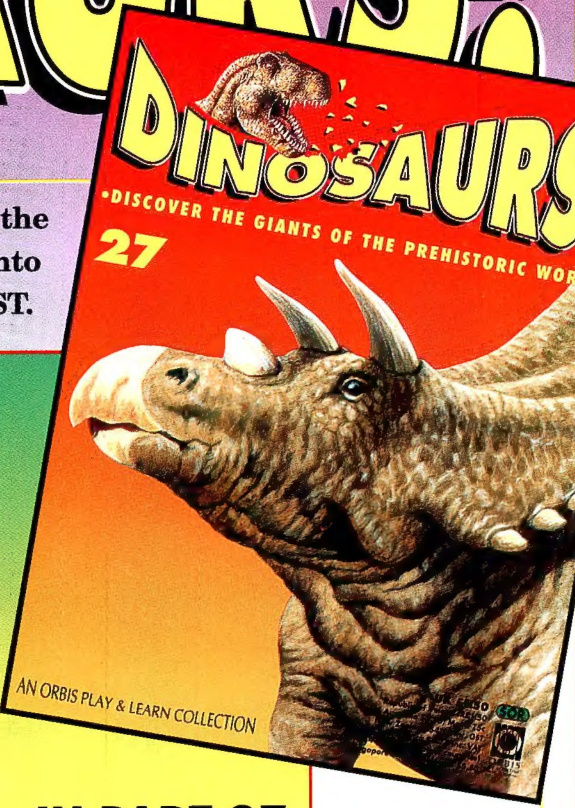
MYA = MILLION YEARS AGO



COMING IN PART 27 OF

DINOSAURS!

Find out which dinosaurs could stand the heat of the desert in DINOWORLD. Two enormous dinosaurs get into a fight in GIANTS OF THE PAST.


DINOSAURS!
•DISCOVER THE GIANTS OF THE PREHISTORIC WORLD•
27
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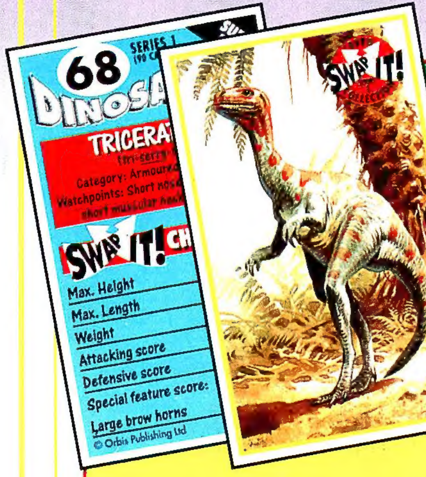

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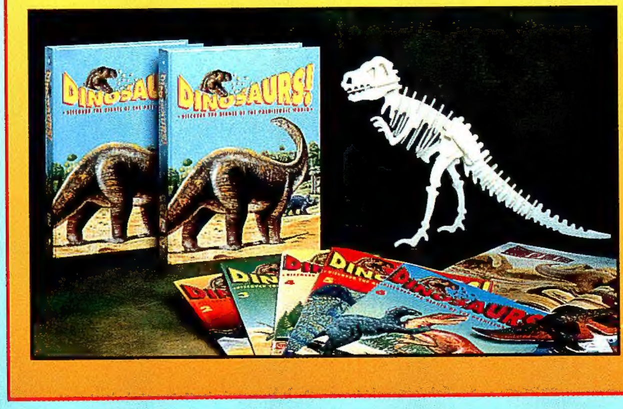

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ANSWERS TO DINO FACT FILE QUESTIONS: 1.c 2.a 3.b 4.c 5.b 6.a 7.c 8.a 9.c 10.c

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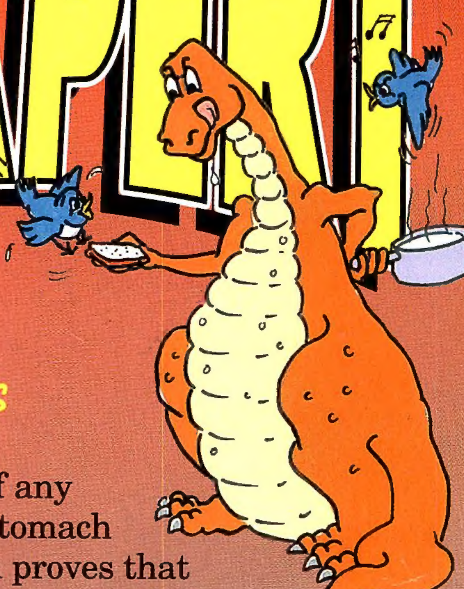
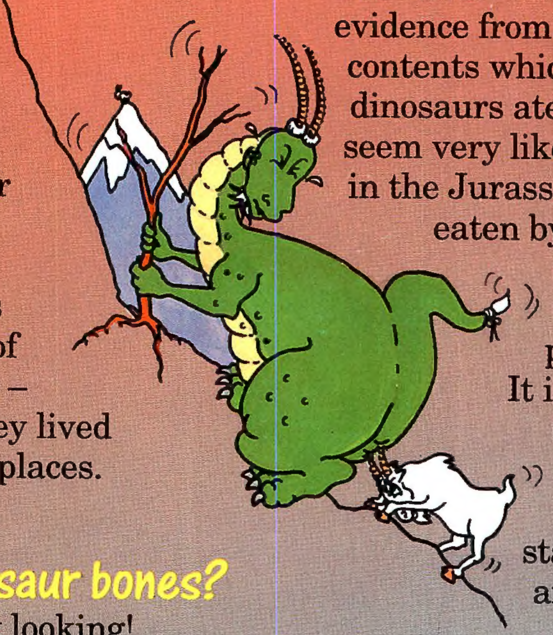
Dr. David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT



Could dinosaurs climb mountains like goats?

Small, agile dinosaurs may have been good climbers. For example, pachycephalosaurs were very goat-like in their habits: they clashed their heads together when fighting and may have lived in high places. This could explain the rarity of pachycephalosaur fossils – they are rare because they lived and died in such remote places.



How do you find dinosaur bones?

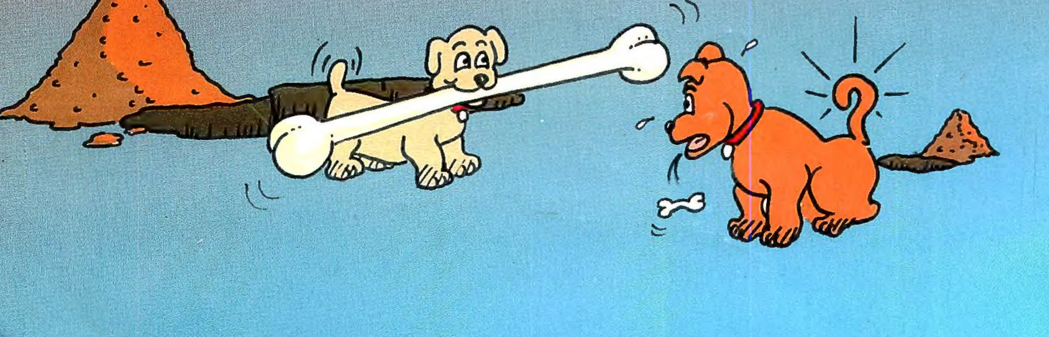
The simple answer is: by looking! However, that is very unfair. To find dinosaur bones you need to look in rocks of a special age – they must be from the Age of the Dinosaurs. They must also have been laid down in the beds of streams or lakes (clays, shales, siltstones and sandstones). So, to find dinosaurs, you need to know what age rocks are and what sort of rocks they are. You'll also need a lot of patience!

Did dinosaurs eat birds?

I do not know of any evidence from stomach contents which proves that dinosaurs ate birds. But it does seem very likely that once birds appeared in the Jurassic they would have been eaten by some dinosaurs. Small, predatory dinosaurs would eat anything that moved – provided they could catch it. It is not difficult to imagine small, perhaps young, theropods such as *Ornitholestes* or *Velociraptor* stalking unsuspecting birds and trying to pounce on them.

Can you find baby dinosaurs inside fossilized dinosaur eggs?

Yes you can! In the USA, Jack Horner has found several *Orodromeus* eggs, which contain the embryonic bones of this dinosaur. Sometimes scanners are used to scan the eggs to see the tiny bones. This gives scientists information which helps to show up the bones inside.



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